Fig. 1

1. couple magnetic beads (·) to antigen-positive cells (◍)

2. add excess antigen-negative cells (○)

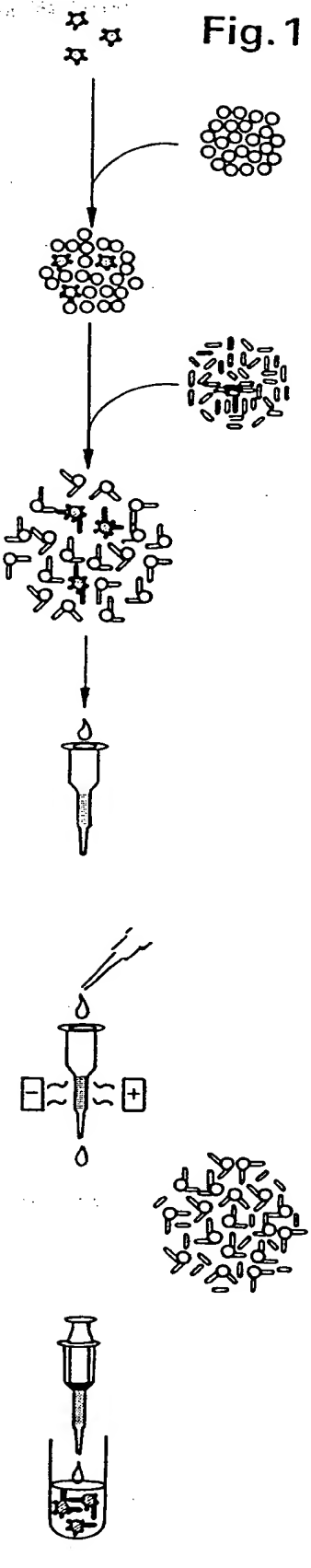
3. add phage library containing specific ▬ and non-specfic ⬭ binders

4. incubate

5. load on column without magnetic field

6. place column in magnetic field and wash away antigen-negative cells and non-specific phage

7. flush antigen-positive cells and bound phage from column, elute bound phage, infect bacterial culture



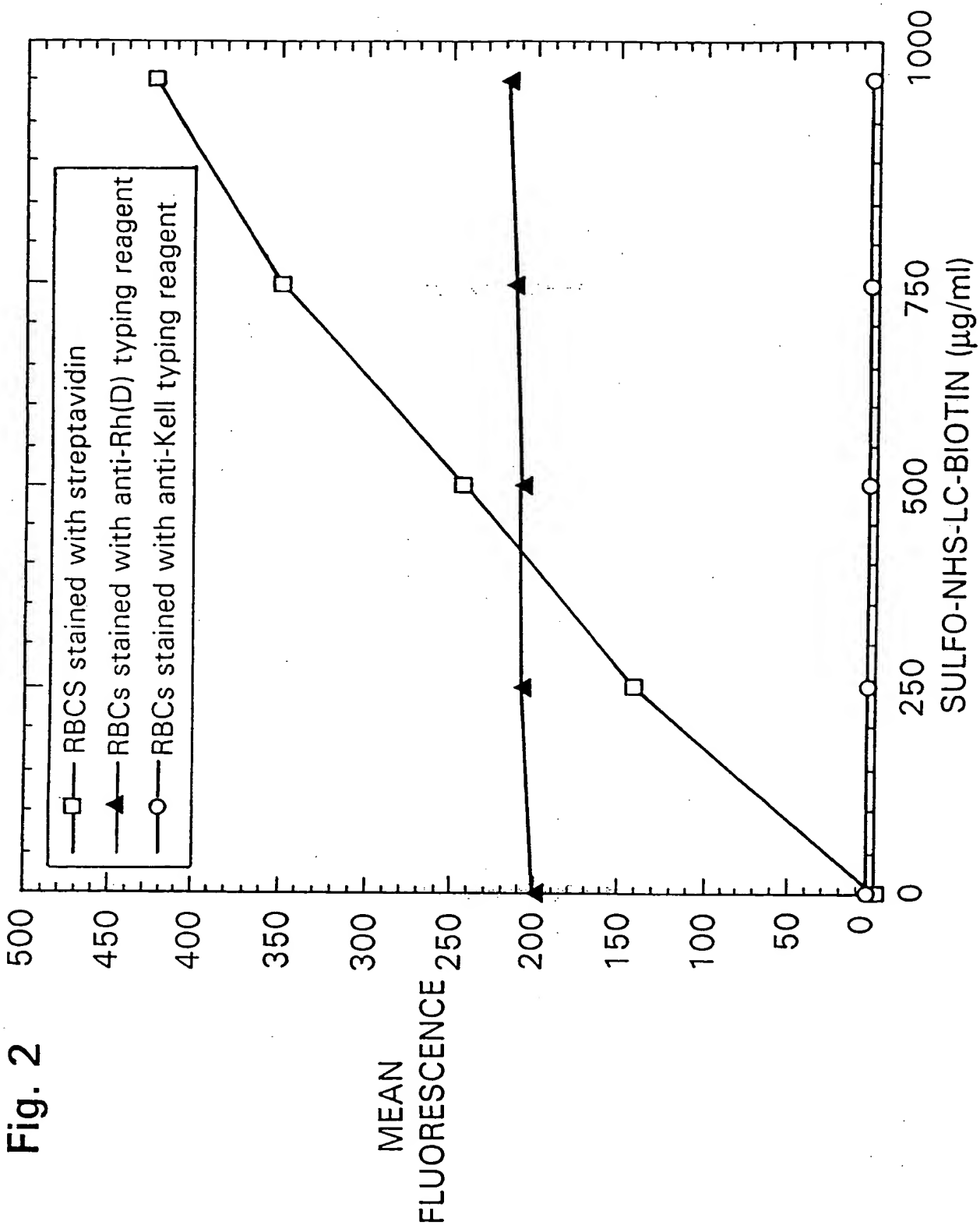

RBCS stained with streptavidin
RBCs stained with anti-Rh(D) typing reagent
RBCs stained with anti-Kell typing reagent
MEAN FLUORESCENCE
SULFO-NHS-LC-BIOTIN (µg/ml)
0
50
100
150
200
250
300
350
400
450
500
0
250
500
750
1000

Fig. 2

Figure 3a

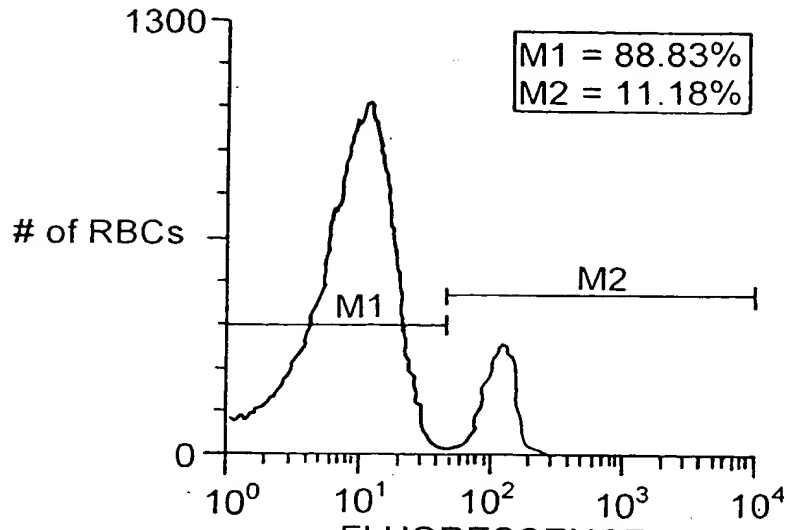


Figure 3b

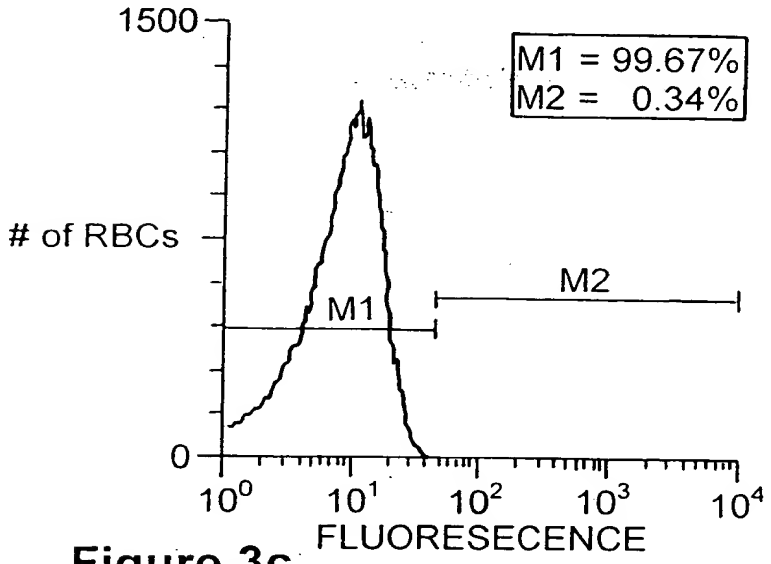
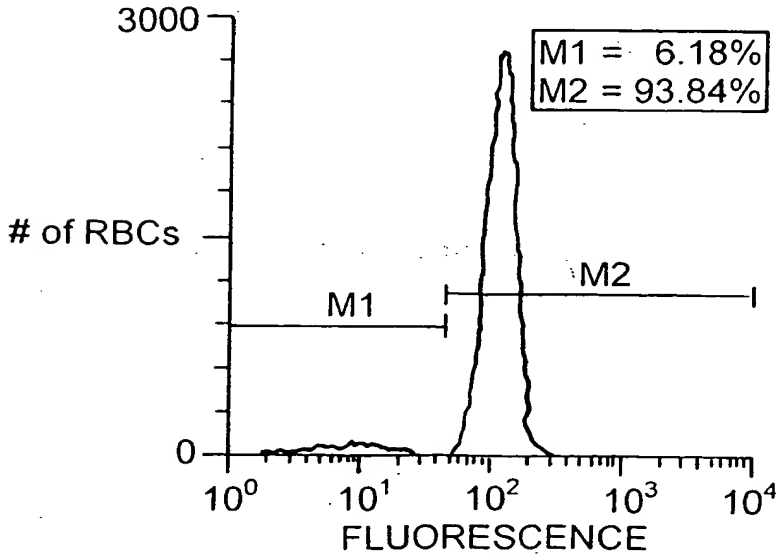


Figure 3c



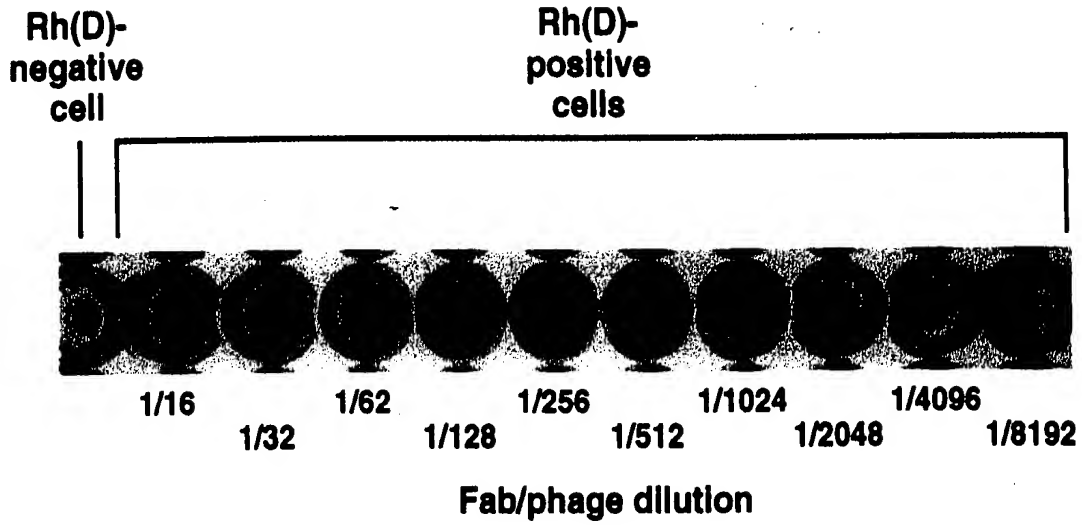


FIG. 4

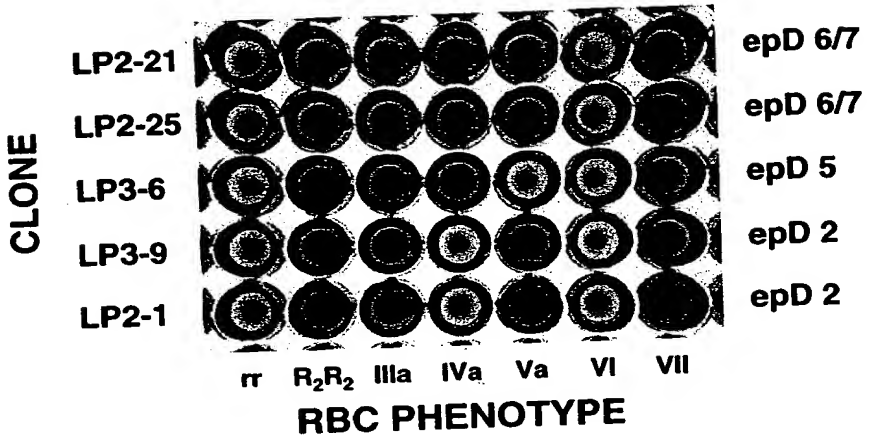
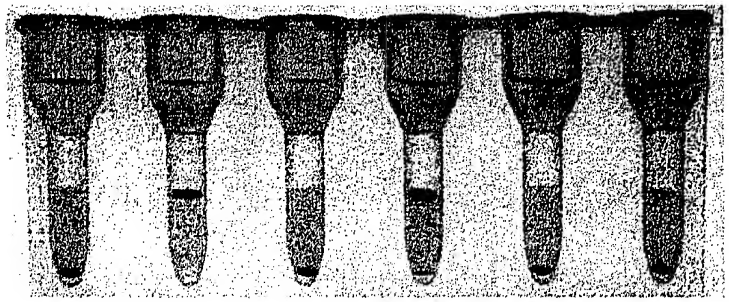

CLONE
LP2-21
LP2-25
LP3-6
LP3-9
LP2-1
epD 6/7
epD 6/7
epD 5
epD 2
epD 2
rr
R2R2
IIIa
IVa
Va
VI
VII
RBC PHENOTYPE

FIG. 5



RBCs are Rh(D):	**neg**	**pos**	**neg**	**pos**	**neg**	**pos**
Fab/phage titer:	**1/125**		**1/625**		**1/3125**	

FIG. 6

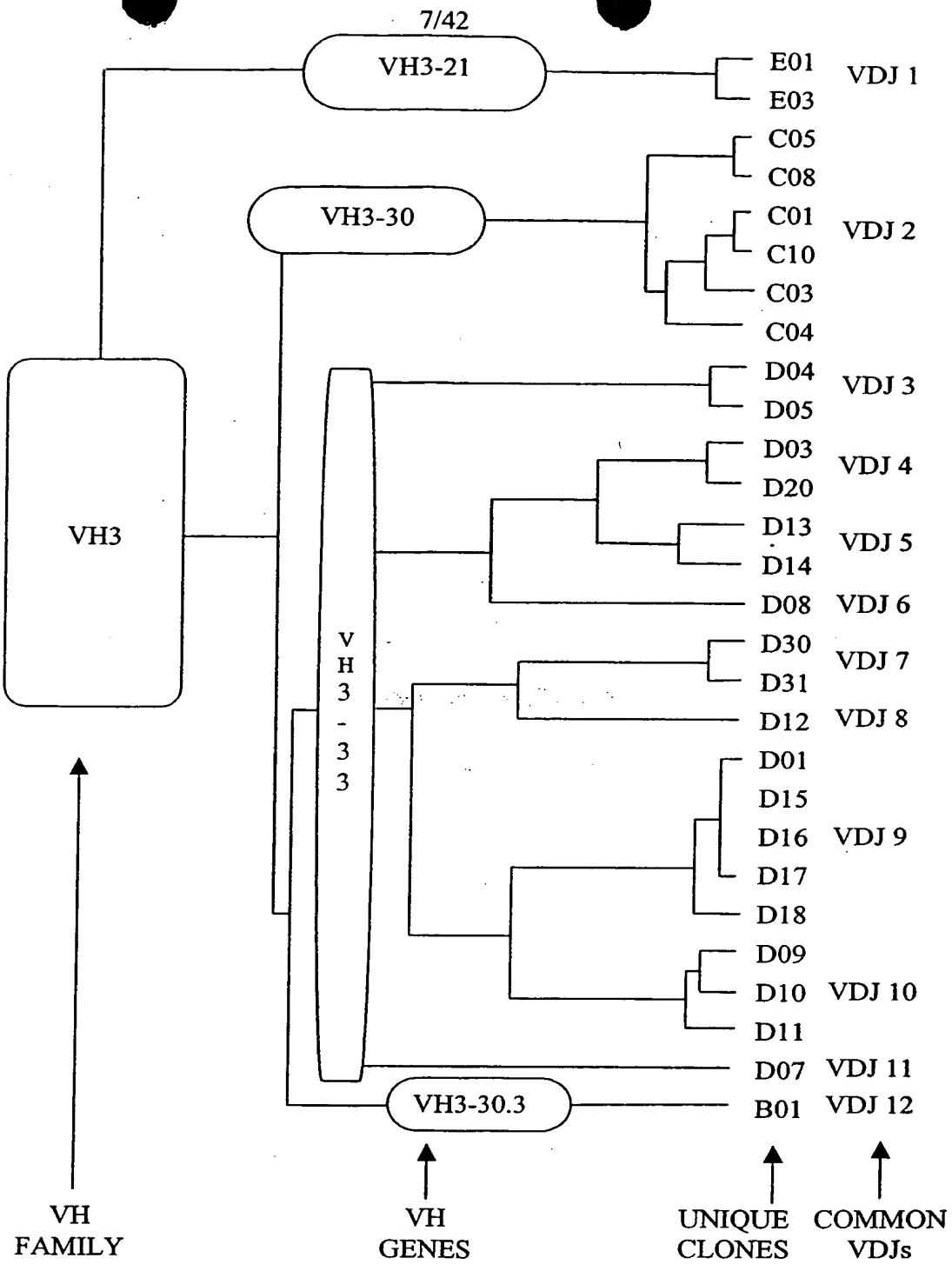
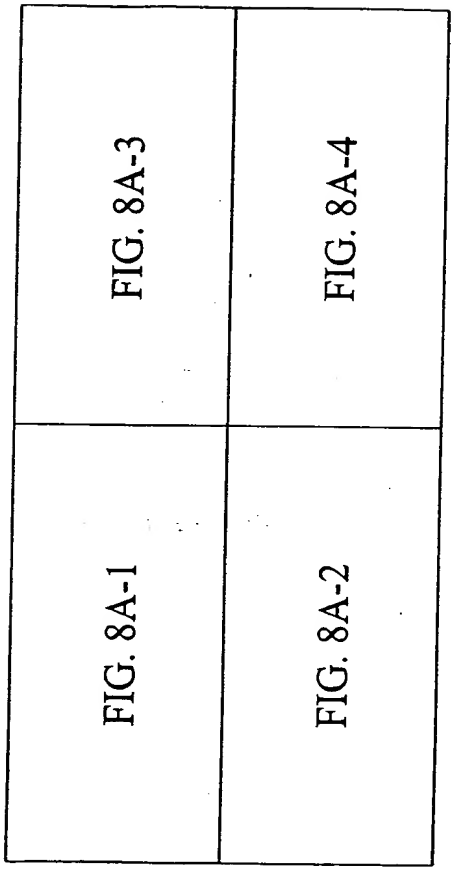

VH3
VH3-21
VH3-30
VH3-30.3
V H 3 - 3 3
E01
E03
VDJ 1
C05
C08
C01
C10
C03
C04
VDJ 2
D04
D05
VDJ 3
D03
D20
VDJ 4
D13
D14
VDJ 5
D08
VDJ 6
D30
D31
VDJ 7
D12
VDJ 8
D01
D15
D16
D17
D18
VDJ 9
D09
D10
D11
VDJ 10
D07
VDJ 11
B01
VDJ 12
VH FAMILY
VH GENES
UNIQUE CLONES
COMMON VDJs

FIG. 7A

```
CAR DSRYSNFLRWVR-SDGMDV WGQG E01
CAR DSRYSNFLRWVR-SDGMDV WGQG E03
CAN LRGEVTRRASVP----LDI WGQG C05
CAN LRGEVTRRASVP----LDI WGQG C08
CAN LRGEVTRRASVP----FDI WGPG C01
CAN LRGEVTRRASVP----FDI WGPG C10
CAN LRGEVTRRASVP----FDI WGPG C03
CAN LRGEVTRRASIP----FDI WGQG C04
CAR DWR-VRAFS-SGWLSAFDI WGQG D04
CAR DWR-VRAFS-SGWLSAFDI WGQG D05
CAR EEV-VR--GVILWSRKFDY WGQG D03
CAR EEV-VR--GVILWSRKFDY WGQG D20
CAR ENV-ARGGGGVRYKYYFDY WGQG D13
CAR ENV-ARGGGGIRYKYYFDY WGQG D14
CAR DQ---RAAAGIFYYSRMDV WGQG D08
CAR ERN-FR-SGYSRYYYGMDV WGPG D30
CAR ERN-FR-SGYSRYYYGMDV WGPG D31
CAR EAS-ML-RGISRYYYAMDV WGPG D12
CAR ENQ-IK-L-WSRYLYYFDY WGQG D01
CAR ENQ-IK-L-WSRYLYYFDY WGQG D15
CAR ENQ-IK-L-WSRYLYYFDY WGQG D16
CAR ENQ-IK-L-WSRYLYYFDY WGQG D17
CAR ENQ-IK-L-WSRYLYYFDY WGQG D18
CAR EGS-KK-VALSRYYYYMDV WGQG D09
CAR EVS-KK-VALSRYYYYMDV WGQG D10
CAR EVS-KK-LALSRYYYYMDV WGQG D11
CAR ERR-EK--VYILFYSWLDR WGQG D07
CAR GGFYYDSSGYYGLRHYFDS WGQG B01
```

FIG. 7B

FIG. 8A



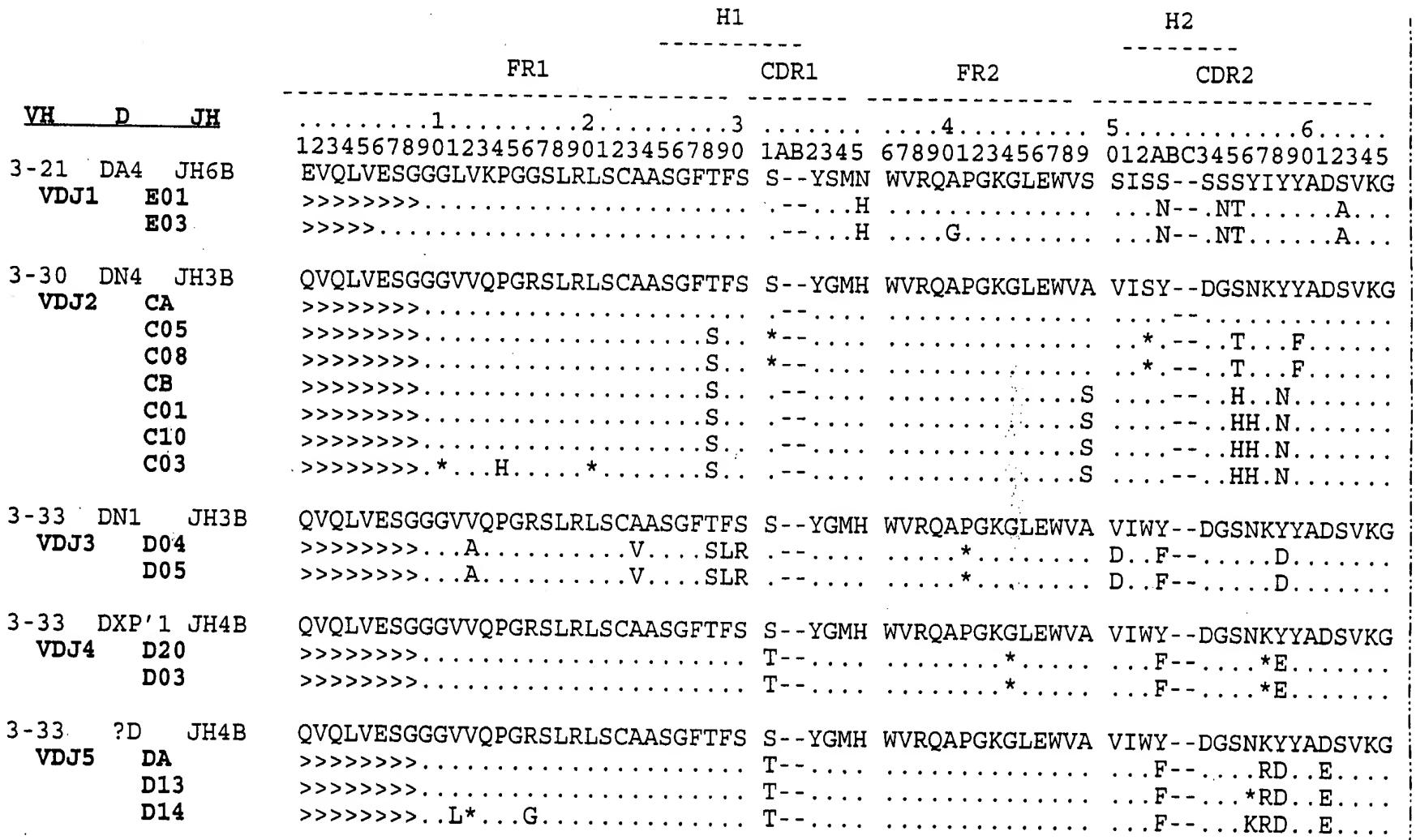

H1
H2
FR1
CDR1
FR2
CDR2
VH D JH
3-21 DA4 JH6B
VDJ1 E01
E03
3-30 DN4 JH3B
VDJ2 CA
C05
C08
CB
C01
C10
C03
3-33 DN1 JH3B
VDJ3 D04
D05
3-33 DXP'1 JH4B
VDJ4 D20
D03
3-33 ?D JH4B
VDJ5 DA
D13
D14

FIG. 8A-1

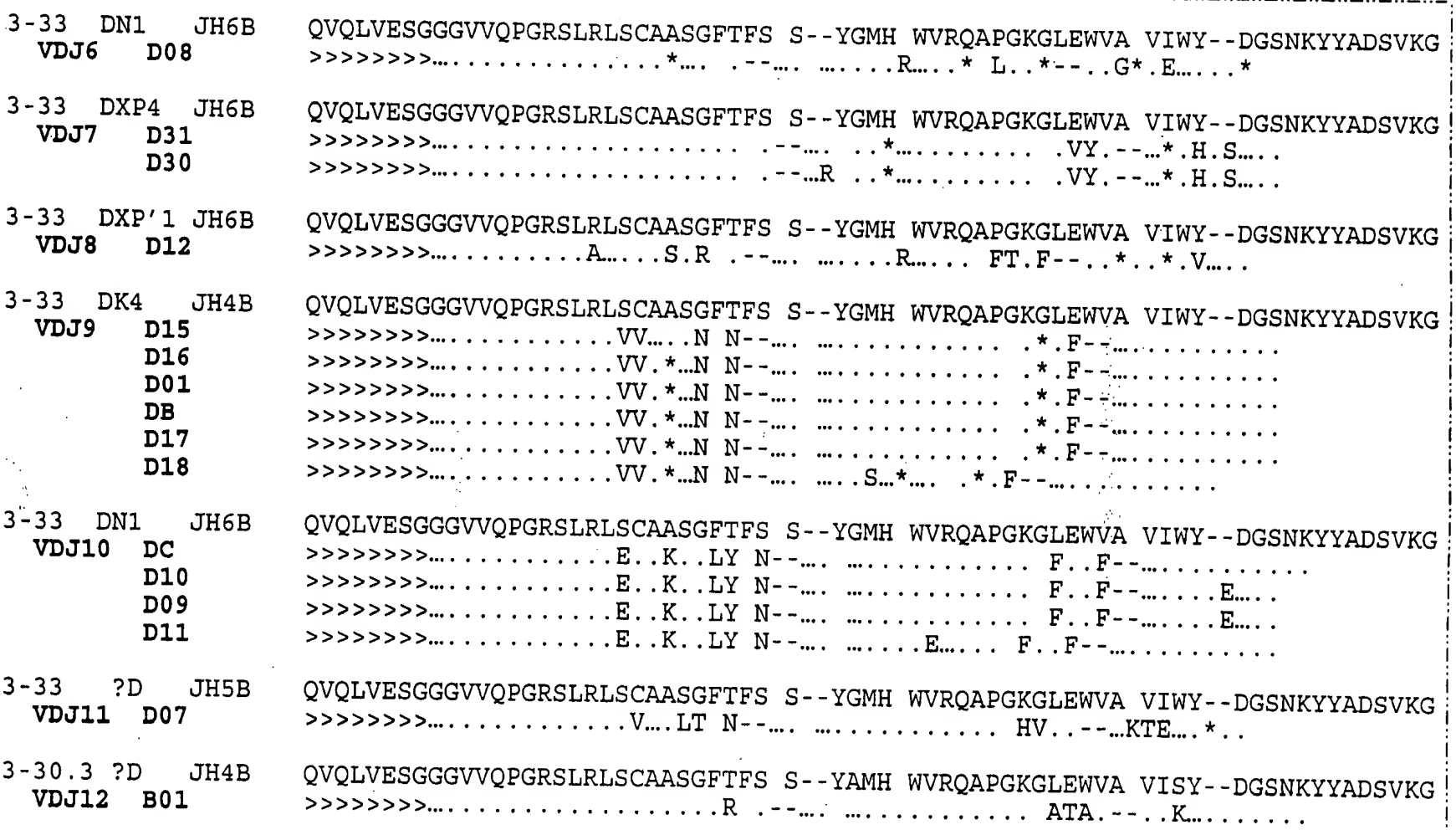

3-33 DN1 JH6B
VDJ6 D08
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>….....*…. .--…. ……R…..* L..*---.G*.E…..*
3-33 DXP4 JH6B
VDJ7 D31
D30
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>…..... .--…. ..*…..... .VY.--…*.H.S…..
>>>>>>>>…..... .--…R ..*…..... .VY.--…*.H.S…..
3-33 DXP'1 JH6B
VDJ8 D12
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>….....A…..S.R .--…. ……R…... FT.F--..*..*.V…..
3-33 DK4 JH4B
VDJ9 D15
D16
D01
DB
D17
D18
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>….....VV…..N N--…. ……. .*.F--…….....
>>>>>>>>….....VV.*…N N--…. ……. .*.F--…….....
>>>>>>>>….....VV.*…N N--…. ……. .*.F--…….....
>>>>>>>>….....VV.*…N N--…. ……. .*.F--…….....
>>>>>>>>….....VV.*…N N--…. ……. .*.F--…….....
>>>>>>>>….....VV.*…N N--…. ….S…*…. .*.F--…….....
3-33 DN1 JH6B
VDJ10 DC
D10
D09
D11
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>….....E..K..LY N--…. ……. F..F--…….....
>>>>>>>>….....E..K..LY N--…. ……. F..F--……..E…..
>>>>>>>>….....E..K..LY N--…. ……. F..F--……..E…..
>>>>>>>>….....E..K..LY N--…. ……E…... F..F--…….....
3-33 ?D JH5B
VDJ11 D07
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA VIWY--DGSNKYYADSVKG
>>>>>>>>….....V….LT N--…. ……. HV..--…KTE….*..
3-30.3 ?D JH4B
VDJ12 B01
QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YAMH WVRQAPGKGLEWVA VISY--DGSNKYYADSVKG
>>>>>>>>….....R .--…. ……. ATA.---.K…....

FIG. 8A-2

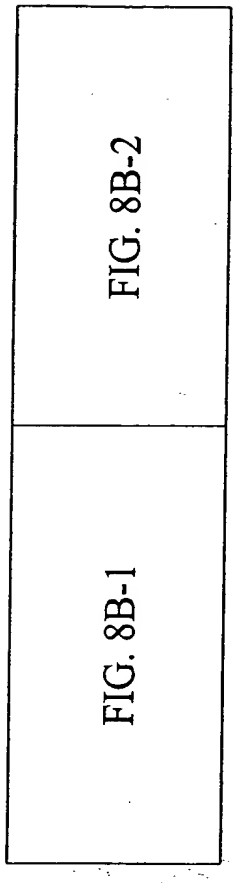
FR3	H3 CDR3	FR4	# NUCLEOTIDE DIFFERENCES FROM GERMLINE VH
....7.....8.....9....	....10.....	.....11...	
67890123456789012abc345678901234	567890abcdefghijk12	34567890123	
RFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR	++DYSNY+++YYYYYGMDV	WGQGTTVTVSS	
.....*....	DSRYSNFLR-WVRSD....	.....I...	6
.....H...*....	DSRYSNFLR-WVRSD....	.....I...	8
RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAK	+++SIAAR++++++DAFDI	WGQGTMVTVSS	
.....K.....P.....N	LRGEVTRRAS----VP...	.....	3
.....K.....T...P.....F..N	LRGEVTRRAS----VPL..	.....	10
.....K.....T...P.....F..N	LRGEVTRRAS----VPL..	.....	10
.....K..*.....P.....N	LRGEVTRRAS----VP...	.....	9
.....K..*.....P.....N	LRGEVTRRAS----IP...	.....	10
.....K..*.....P....*....N	LRGEVTRRAS----VP...	..P.....	11
.....K..*.....P....*....N	LRGEVTRRAS----VP...	..P..L.....	11
.....K..*.....P....*....N	LRGEVTRRAS----VP..*	..P...*....	14
RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR	+++++GYSSSWY++DAFDI	WGQGTMVTVSS	
.....*.*.....*...	DWRVRAFSSGWL--S....	.....*.	13
.....*.*.....*...	DWRVRAFSSGWL--S....	.....T.S.*.	13
RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR	ITMVRGVII++++++YFDY	WGQGTLVTVSS	
.....*.....	EEVVRGVILWSR---K...	.....	7
...V.....*.....	EEVVRGVILWSR---K...	.....	8
RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR	++++++++++++++YFDY	WGQGTLVTVSS	
.....*.....S.....	ENVARGGGG?RYKY-....	.....	8
.....K...*.....S...*...	ENVARGGGGVRYKY-....	.....	11
.....*...*.....S.....	ENVARGGGGIRYKY-....	.....	13

FIG. 8A-3

```
RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR +GIAAAG+++YYYYYGMDV WGQGTTVTVSS
..S........*....V.....D...*..... DQRAAAG---IF**SR... .......... 15

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR YYDFWSGYYTYYYYYGMDV WGQGTTVTVSS
.......*......*..D.............. ERNFRSGY--SR..... ..P........ 11
.......*......*..D.............. ERNFRSGY--SR..... ..P........ 12

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR +ITMVRGVIIYYYYYGMDV WGQGTTVTVSS
..............E.....VD...*..... EASMLRGI--SR...A... ..P........ 14

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR ++WIQLWL+++++++YFDY WGQGTLVTVSS
..........*.*.................. ENQIKLWSRYLY---.... .......... 9
..........*.*.................. ENQIKLWSRYLY---.... .......... 10
..........*.*.................. ENQIKLWSRYLY---..*. .......... 10
..........*.*.................. ENQIKLWSRYLY---.... .......... 10
..........*.*.................. ENQIKLWSRYLY---.... ..........* 10
..........*.*.................. ENQIKLWSRYLY---.... ......*.... 12

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR +++GYSSSWYYYYYYGMDV WGQGTTVTVSS
...V........................... EVSKK?AL--SR...Y... ..*....*... 12
...V........................... EVSKKVAL--SR*..Y... ..*....*... 13
...V........................... EGSKKVAL--SR*.*Y... ..*....*.*. 13
...V........................... EVSKKLAL--SR...Y... ..*....*... 14

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR ++++++++++++NWFDP WGQGTLVTVSS
..AV...K..*..F......T.....I..... ERREKVYILFY---S.L.R .......... 23

RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR ++++++++++++++YFDY WGQGTLVTVSS
............F.............F.... GGFYYDSSGYYGLRH...S .......... 8
```

FIG. 8A-4

FIG. 8B



```
VH        HOMOLOGY
           TO CON.   .........1.........2.........3 ....... ....4.........
                     123456789012345678901234567890 1AB2345 67890123456789
3-21         85%     E.........L.K..G.............. .--.S.N .............S
3-30         98      .............................. .--.G.. ..............
3-33         98      .............................. .--.G.. ..............
3-30.3       99      .............................. .--.A.. ..............
CONSENSUS            QVQLVESGGGVVQPGRSLRLSCAASGFTFS S--YGMH WVRQAPGKGLEWVA
```

FIG. 8B-1

```
5.....6.....  ....7.....8.....9....   CHOTHIA
012ABC3456789012345 67890123456789012ABC345678901234   CLASS
S..S--SS.YI.....  .....A..S.....   1-3
.....--.....  .....K   1-3
..W.--.....  .....   1-3
....--.....  .....   1-3
VISY--DGSNKYYADSVKG RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR
```

FIG. 8B-2

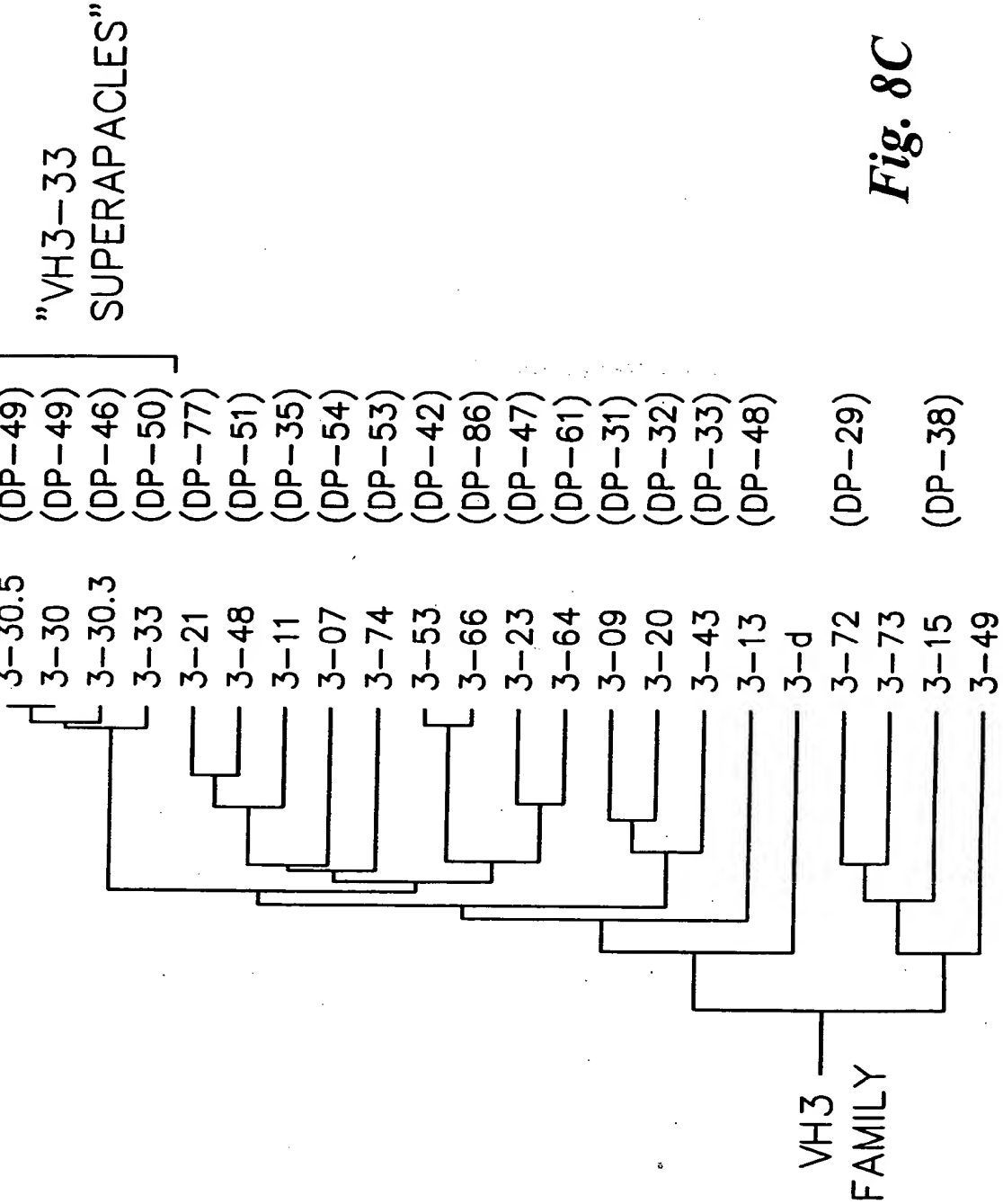

"VH3–33 SUPERAPACLES"
(DP–49)
(DP–49)
(DP–46)
(DP–50)
(DP–77)
(DP–51)
(DP–35)
(DP–54)
(DP–53)
(DP–42)
(DP–86)
(DP–47)
(DP–61)
(DP–31)
(DP–32)
(DP–33)
(DP–48)
(DP–29)
(DP–38)
3–30.5
3–30
3–30.3
3–33
3–21
3–48
3–11
3–07
3–74
3–53
3–66
3–23
3–64
3–09
3–20
3–43
3–13
3–d
3–72
3–73
3–15
3–49
VH3 FAMILY

Fig. 8C

FIG. 9

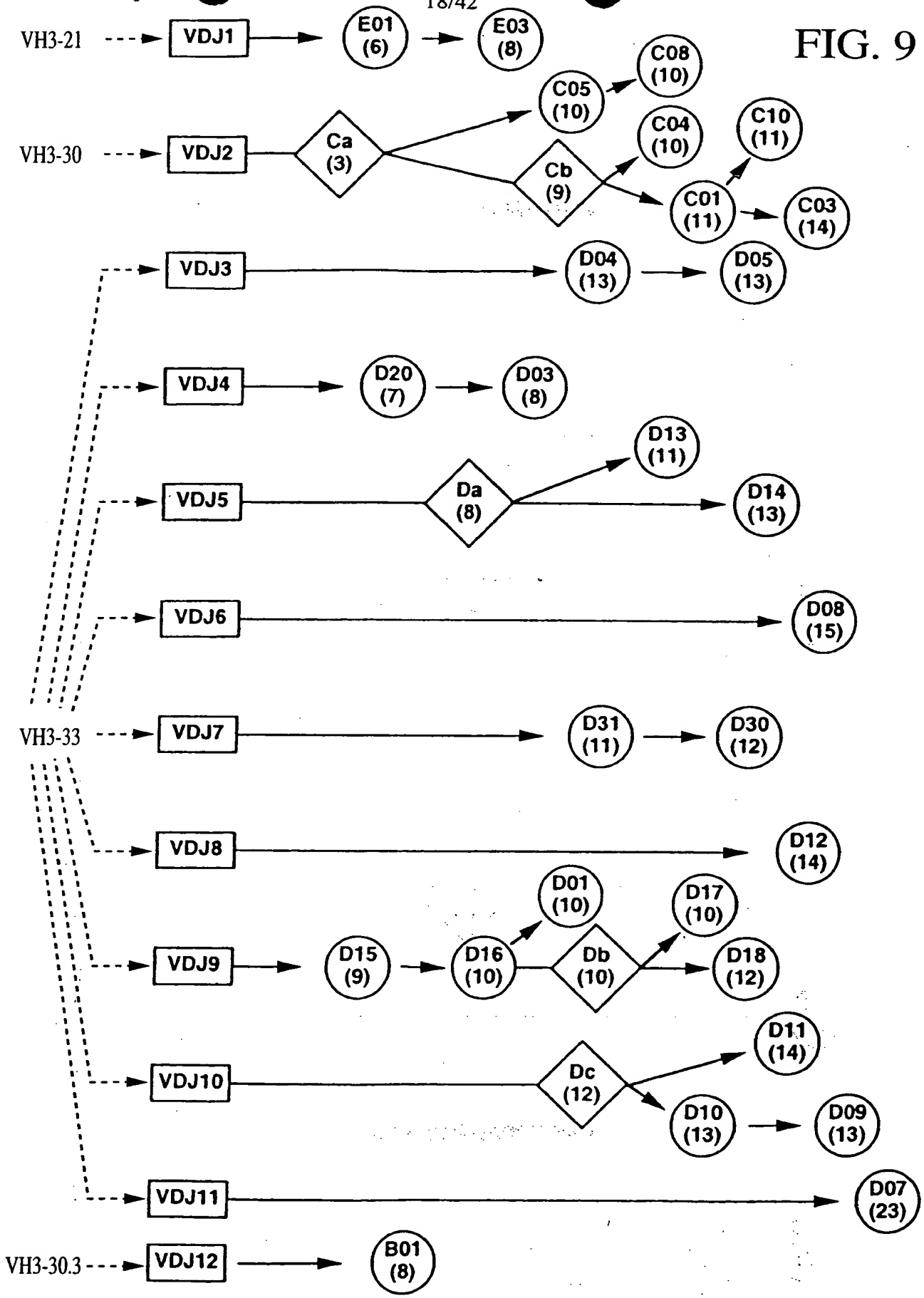
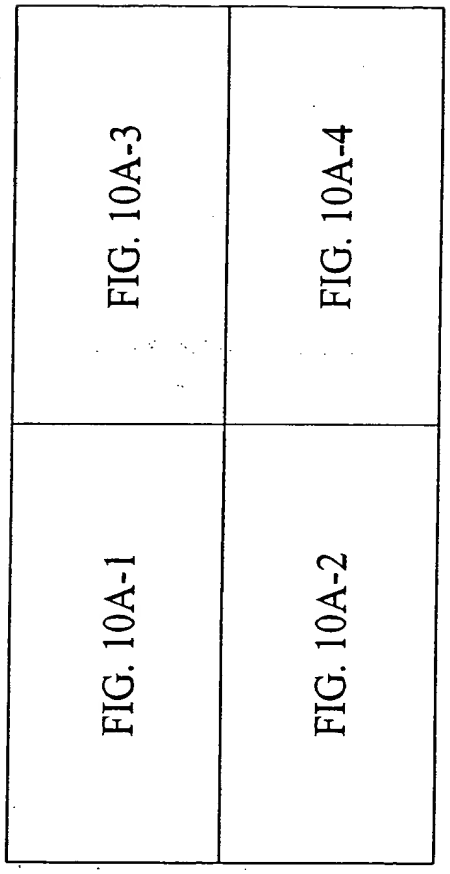
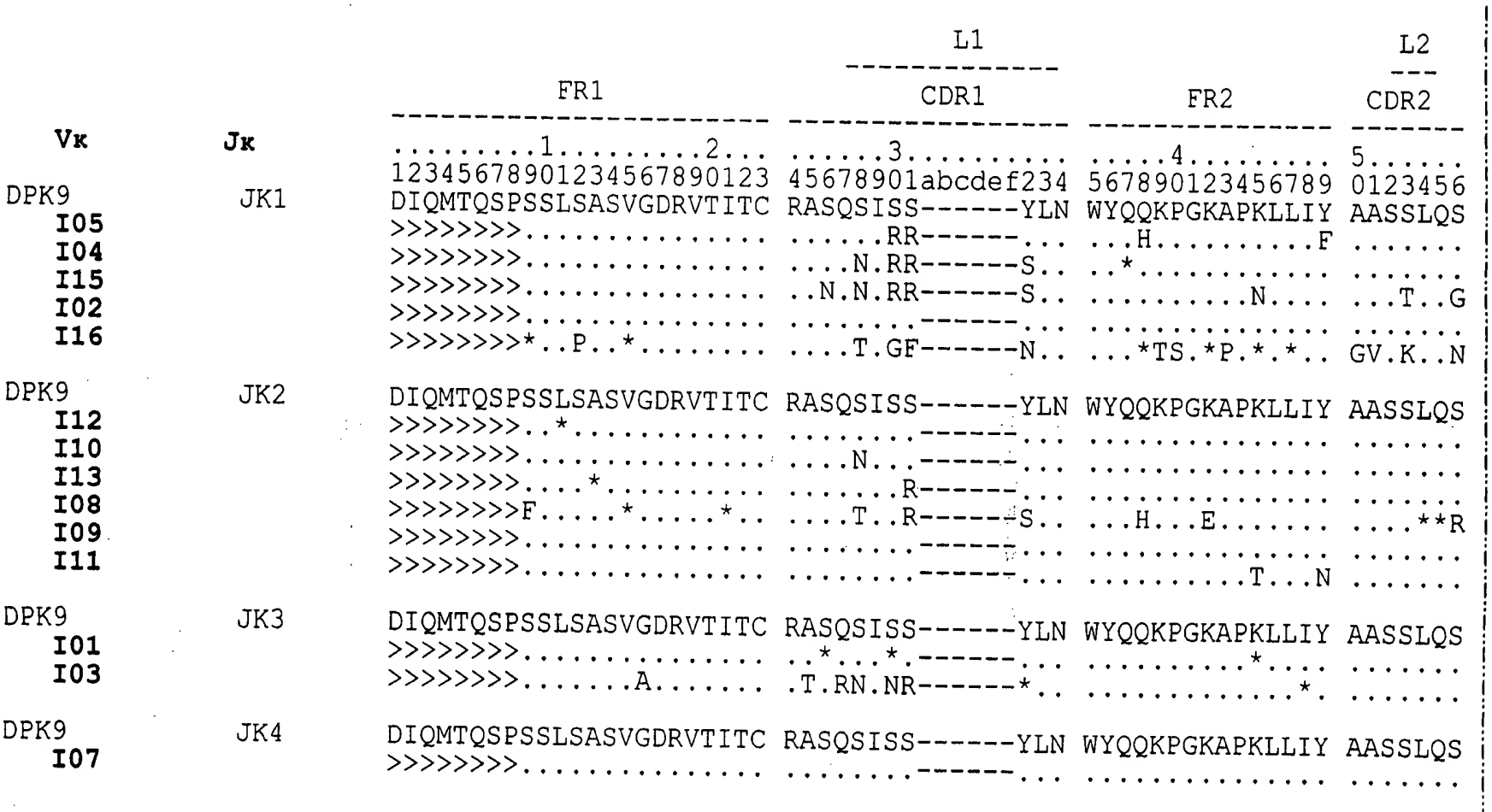

VH3-21
VDJ1
E01 (6)
E03 (8)
VH3-30
VDJ2
Ca (3)
C05 (10)
C08 (10)
Cb (9)
C04 (10)
C10 (11)
C01 (11)
C03 (14)
VDJ3
D04 (13)
D05 (13)
VDJ4
D20 (7)
D03 (8)
VDJ5
Da (8)
D13 (11)
D14 (13)
VDJ6
D08 (15)
VH3-33
VDJ7
D31 (11)
D30 (12)
VDJ8
D12 (14)
VDJ9
D15 (9)
D16 (10)
D01 (10)
Db (10)
D17 (10)
D18 (12)
VDJ10
Dc (12)
D11 (14)
D10 (13)
D09 (13)
VDJ11
D07 (23)
VH3-30.3
VDJ12
B01 (8)

FIG. 10A





Vκ	Jκ	FR1	L1 CDR1	FR2	L2 CDR2
		.....1.....2...	.....3.....	.....4.....	5.....
		12345678901234567890123	45678901abcdef234	567890123456789	0123456
DPK9	JK1	DIQMTQSPSSLSASVGDRVTITC	RASQSISS------YLN	WYQQKPGKAPKLLIY	AASSLQS
I05		>>>>>>>>.....	.....RR------...	...H.....F	.....
I04		>>>>>>>>.....	....N.RR------S..	..*.....	.....
I15		>>>>>>>>.....	..N.N.RR------S..	.....N....	...T..G
I02		>>>>>>>>.....	.....------...	.....	.....
I16		>>>>>>>>*..P..*.....	....T.GF------N..	...*TS.*P.*.*..	GV.K..N
DPK9	JK2	DIQMTQSPSSLSASVGDRVTITC	RASQSISS------YLN	WYQQKPGKAPKLLIY	AASSLQS
I12		>>>>>>>>..*.....	.....------...	.....	.....
I10		>>>>>>>>.....	....N...------...	.....	.....
I13		>>>>>>>>....*.....	.....R------...	.....	.....
I08		>>>>>>>>F.....*.....*..	....T..R------S..	...H...E.....	....**R
I09		>>>>>>>>.....	.....------...	.....	.....
I11		>>>>>>>>.....	.....------...	.....T...N	.....
DPK9	JK3	DIQMTQSPSSLSASVGDRVTITC	RASQSISS------YLN	WYQQKPGKAPKLLIY	AASSLQS
I01		>>>>>>>>.....	..*...*.------...	.....*....	.....
I03		>>>>>>>>.....A.....	.T.RN.NR------*..	.....*.	.....
DPK9	JK4	DIQMTQSPSSLSASVGDRVTITC	RASQSISS------YLN	WYQQKPGKAPKLLIY	AASSLQS
I07		>>>>>>>>.....	.....------...	.....	.....

FIG 10A-1

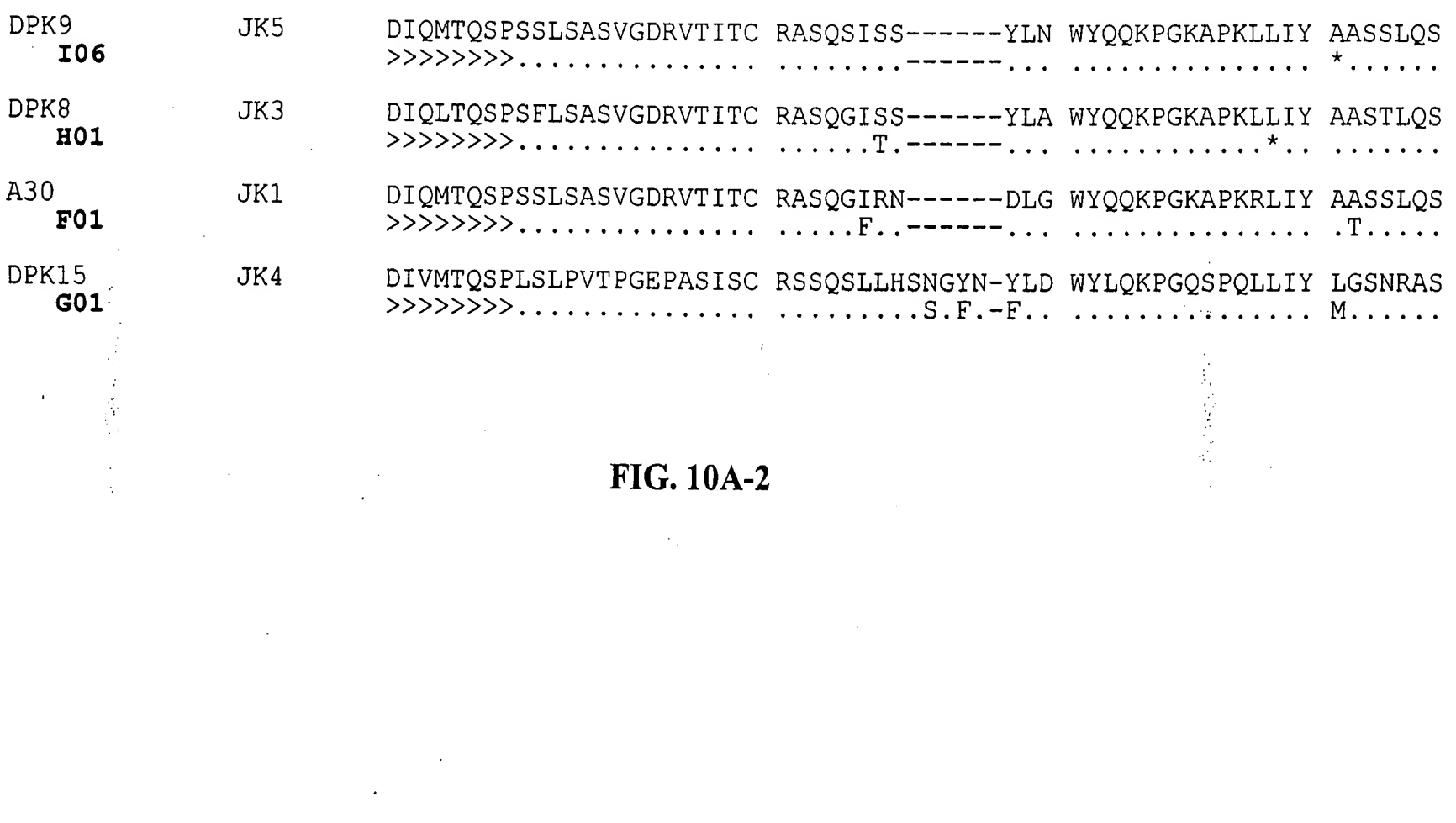

DPK9 JK5 DIQMTQSPSSLSASVGDRVTITC RASQSISS------YLN WYQQKPGKAPKLLIY AASSLQS
I06 >>>>>>>>..... .....------... ..... *.....
DPK8 JK3 DIQLTQSPSFLSASVGDRVTITC RASQGISS------YLA WYQQKPGKAPKLLIY AASTLQS
H01 >>>>>>>>..... .....T.------... .....*.. .....
A30 JK1 DIQMTQSPSSLSASVGDRVTITC RASQGIRN------DLG WYQQKPGKAPKRLIY AASSLQS
F01 >>>>>>>>..... .....F..------... ..... .T.....
DPK15 JK4 DIVMTQSPLSLPVTPGEPASISC RSSQSLLHSNGYN-YLD WYLQKPGQSPQLLIY LGSNRAS
G01 >>>>>>>>..... .....S.F.-F.. ..... M.....

FIG. 10A-2

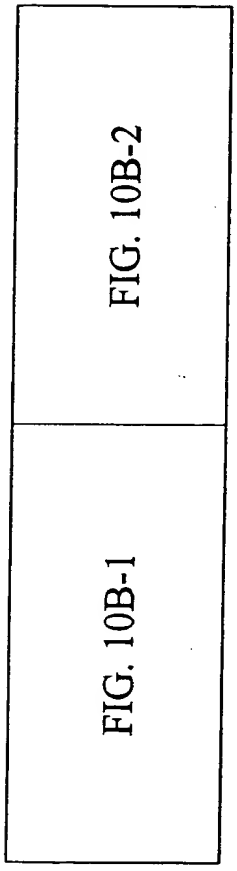
FR3	L3 CDR3	FR4	# nucleotide differences from germline Vκ
...6.....7.....8.....	.9.....	.10.....	
78901234567890123456789012345678	9012345a67	89012345678	
GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC	QQSYSTP+WT	FGQGTKVEIK	
......T.....	.....-Q.	.....	6
.....	*..SN.*-..	.....	11
.....LA.....	..TSA.*-..	.....	20
.....	.....L-..	.....	4
..*.*....**.*E.*.*....*.*..*.**.	..TNDAL-..	.....*..VR	49
GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC	QQSYSTP+YT	FGQGTKLEIK	
.....	.....P..	.....	1
..L.....	.....P*S	.....	2
.....	....G..-HS	..R.....	4
...P.....*.*..F.	...VRI*-.S	.....	23
.....S.....*..	..LN.Y*-..	.....	11
.....*.....*.I...	..RE-----.	.....	5
GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC	QQSYSTP+FT	FGPGTKVDIK	
...T.....	.....-P.	.....EM.	4
.....T.....*....	.....-..	.....L.	13
GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC	QQSYSTP+LT	FGGGTKVEIK	
.....	.....-R.	.....	1

FIG. 10A-3

```
GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQSYSTP+IT FGQGTRLEIK
..................................  ......*-..  ..........   4

GVPSRFSGSGSGTEFTLTISSLQPEDFATYYC QQLNSYP+FT FGPGTKVDIK
.....................A....D.......  ....N.*P..  ..........   8

GVPSRFSGSGSGTEFTLTISSLQPEDFATYYC LQHNSYP+WT FGQGTKVEIK
.....................N......S.....  .....F*-..  ..........   8

GVPDRFSGSGSGTDFTLKISRVEAEDVGVYYC MQALQTP+LT FGGGTKVEIK
.....................N.............  .....F.-..  ..........   8
```

FIG. 10A-4

FIG. 10B



Vκ	
GENE	**FAM.**
DPK9	I
DPK8	I
A30	I
DPK15	II

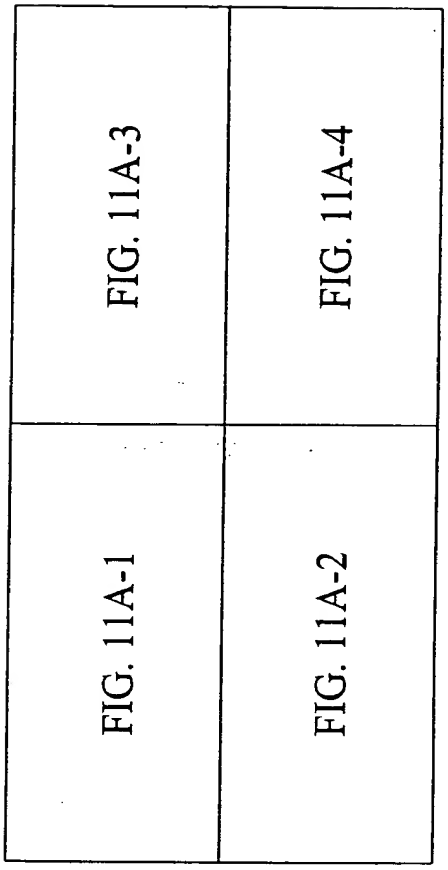
```
DIQMTQSPSSLSASVGDRVTITC RASQSISS------YLN
...L.....F..............  ....G...------..A
.......................  ....G.RN------D.G
..V.....L..PVTP.EPAS.S.  .S...LLHSNGYN-..D
```

FIG. 10B-1

```
WYQQKPGKAPKLLIY AASSLQS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQSYSTP
.............. ...T... ............E.................. ..LN.Y.
...........R... ....... ............E.................. L.HN.Y.
..L....QS.Q.... LG.NRA. ...D............K..RVEA..VGV... M.ALQ..
```

FIG. 10B-2

FIG. 11A

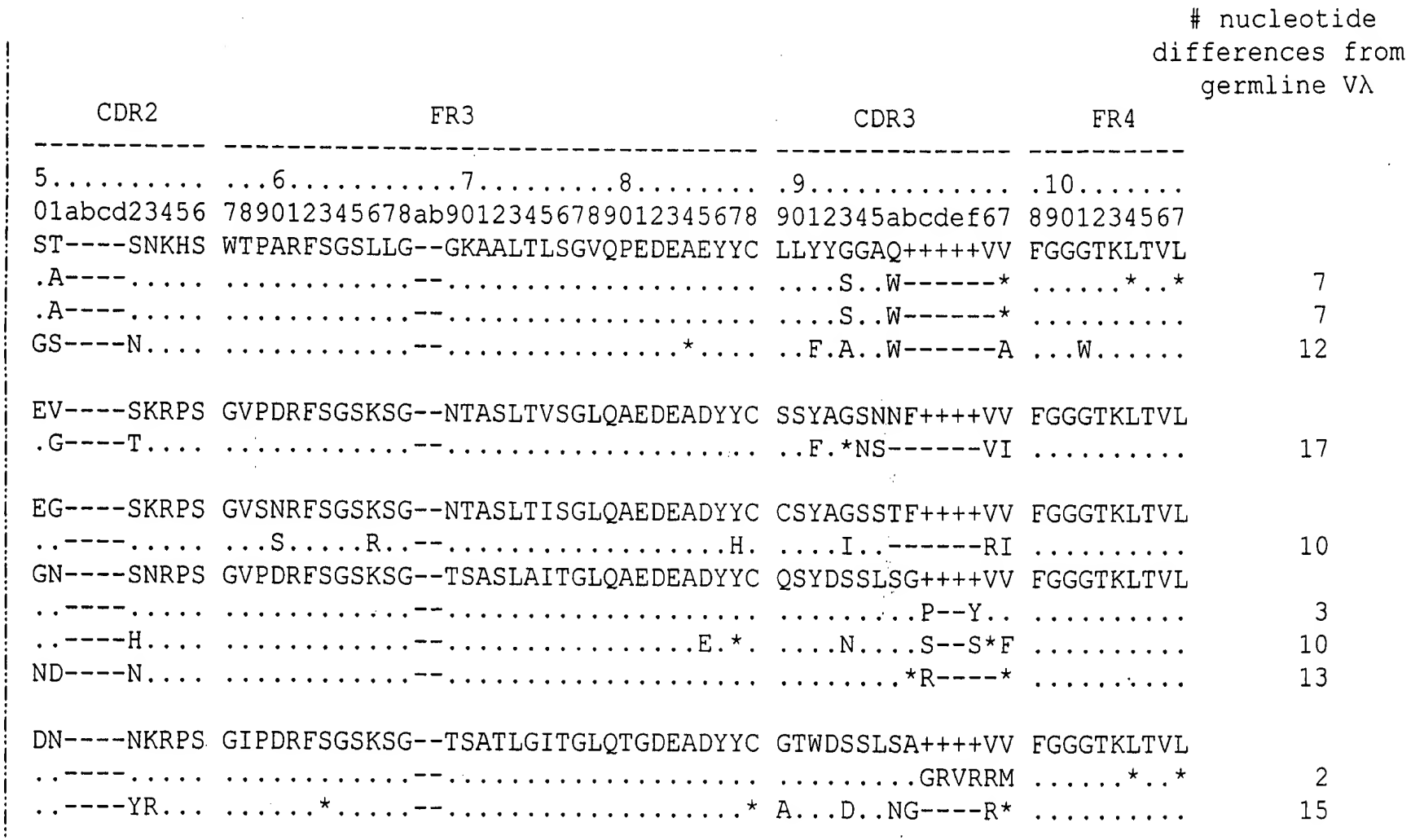


		FR1	CDR1	FR2
Vλ	**Jλ**	.....2...	.....3.....	.....4.....
		12345678912345678901 23	45678901abc234	567890123456789
7a.2.3/DPL18	JL2Vasicek	QTVVTQEPSLTVSPGGTVTLTC	ASSTGAVTSGYYPN	WFQQKPGQAPRALIY
K01		>>>>>>>>.....	.....R.F..	.....P...
K02		>>>>>>>>.....	.....R.F..	.....P...
K03		>>>>>>>>.....	.....R.F..	.....**.....
2c.118D9+	JL2Vasicek	QSALTQPPSASGSPGQSVTISC	TGTSSDVGGYNYVS	WYQQHPGKAPKLMIY
R01		>>>>>>>>.....	..A.....A.KH..	...*.....LTH
DPL10/lv2066	JL2Vasicek	QSALTQPASVSGSPGQSITISC	TGTSSDVGSYNLVS	WYQQHPGKAPKLMIY
S01		>>>>>>>>.....	----....N.....	....Y..*....I..
DPL7/VL1.2	JL2Vasicek	QSVVTQPPSVSGAPGQRVTISC	TGSSSNIGAGYDVH	WYQQLPGTAPKLLIY
O03		>>>>>>>>>>....*.T.....	.....	.....
O02		>>>>>>>>.....T.....	.....S...R....	..*H.....
O01		>>>>>>>>.....	.....P.G..	....F.....V.*
1b.366F5/DPL5	JL2Vasicek	QSVLTQPPSVSAAPGQKVTISC	SGSSSNIGNNY-VS	WYQQLPGTAPKLLIY
N02		>>>>>>>>.....	.....-*.	...*.....
N01		>>>>>>>>.....	.....DS*.-..	.....F

FIG. 11A-1

```
1g.400B5/DPL3 JL2Vasicek    QSVLTQPPSASGTPGQRVTISC SGSSSNIGSNY-VY WYQQLPGTAPKLLIY
   M02                      >>>>>>>>.............. ...........-.* ..............
   M03                      >>>>>>>>.............. ...........-.. ..............
   M01                      >>>>>>>>........*..... .*.NF......-.F ...HV....*.....

1c.10.2/DPL2  JL2Vasicek    QSVLTQPPSASGTPGQRVTISC SGSSSNIGSNT-VN WYQQLPGTAPKLLIY
   L05                      >>>>>>>>....*..L..... ..........I-.. .............F
   L03                      >>>>>>>>.............. .**.....N.H-.S ...*...M.......
   L04                      >>>>>>>>..........S... ...........-.. .......*......S
   L01                      >>>>>>>>.............. ..G....A...-.. ...*...........

DPL16/VL3.1   JL2Vasicek    SSELTQDPAVSVALGQTVRITC QGDSLR---SYYAS WYQQKPGQAPVLVIY
   J02                      >>>>>>>>>>>>.........*. ...G..---*.... .....*...*K..M*
   J01                      >>>>>>>>>>>>.........*. ...G..---*.... .....*...*K..M*
   J05                      >>>>>>>>>>>>......K... *.....---K.... ..........*..F.
   J04                      >>>>>>>>>>>>.......... ......---..... ..............

3p.81A4+      JL2Vasicek    SYELTQPPSVSVSPGQTARITC SGDALP---KKYAY WYQQKSGQAPVLVIY
   P01                      >>>>>>>>....A.R*...*.* G**KIG---SNTVH ..R.M.....*....

4b.68B6       JL2Vasicek    QLVLTQSPSASASLGASVKLTC TLSSG--HSSYAIA WHQQQPEKGPRYLMK
   Q01                      >>>>>>>>*.T....G..*... I.Q.*--.RN..V* ..H*EAG..**F..T
```

FIG. 11A-2



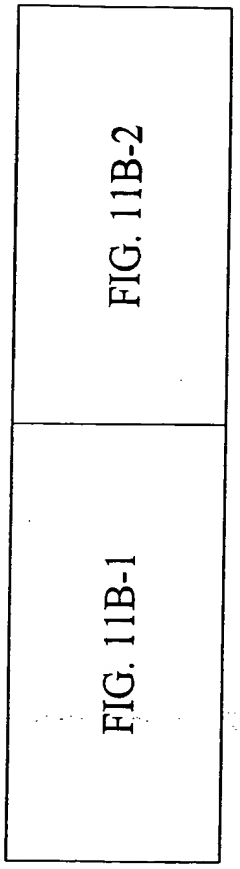
CDR2	FR3	CDR3	FR4	# nucleotide differences from germline Vλ
5.....	...6.....7.....8.....	.9.....	.10.....	
01abcd23456	789012345678ab90123456789012345678	9012345abcdef67	8901234567	
ST----SNKHS	WTPARFSGSLLG--GKAALTLSGVQPEDEAEYYC	LLYYGGAQ+++++VV	FGGGTKLTVL	
.A----.....	.....--.....	....S..W------*	......*..*	7
.A----.....	.....--.....	....S..W------*	.....	7
GS----N....	.....--.....*....	..F.A..W------A	...W.....	12
EV----SKRPS	GVPDRFSGSKSG--NTASLTVSGLQAEDEADYYC	SSYAGSNNF++++VV	FGGGTKLTVL	
.G----T....	.....--.....	..F.*NS------VI	.....	17
EG----SKRPS	GVSNRFSGSKSG--NTASLTISGLQAEDEADYYC	CSYAGSSTF++++VV	FGGGTKLTVL	
..----.....	...S.....R..--.....H.	....I..------RI	.....	10
GN----SNRPS	GVPDRFSGSKSG--TSASLAITGLQAEDEADYYC	QSYDSSLSG+++++VV	FGGGTKLTVL	
..----.....	.....--.....	.....P--Y..	.....	3
..----H....	.....--.....E.*.	....N....S--S*F	.....	10
ND----N....	.....--.....	.....*R----*	.....	13
DN----NKRPS	GIPDRFSGSKSG--TSATLGITGLQTGDEADYYC	GTWDSSLSA++++VV	FGGGTKLTVL	
..----.....	.....--.....	.....GRVRRM	......*..*	2
..----YR...	......*.....--.....*	A...D..NG----R*	.....	15

FIG. 11A-3

```
RN----NQRPS GVPDRFSGSKSG--TSASLAISGLRSEDEADYYC AAWDDSLSG+++VV FGGGTKLTVL
..----..... ...........--..................... .........----W* .........      3
..----..... ...........--...........A..... *.......A----.. .....*....      6
N.----.**.* .....L.....--A.....N....D..... TG...R..*----LI ....P*V...     23

SN----NQRPS GVPDRFSGSKSG--TSASLAISGLQSEDEADYYC AAWDDSLNG+++VV FGGGTKLTVL
..----.K... ...........--..................... *T.......----R* .........      8
*.----G.... ...........--.......**.........*. ...H..*Y.----P* .........*     18
T.----..G.. *...........--..S.......R*.A.D.... .....T...----.. .....*....     14
..----..... ...........--...T.V.T...TG*.*...* GT..H.RS.----A* .....*...*     18

GK----NNRPS GIPDRFSGSSSG--NTASLTITGAQAEDEADYYC NSRDSSGNH+++VV FGGGTKLTVL
.R----..... ..........*--Q..A...*.T..*..... Q.*AT*..P----.* ....*....*     25
.R----..... ...G.......*--Q..A...*.T..*..... Q.*AT*..P----.* ....*....*     26
AR----*S... .........N..--T......A..R..... H....N.H.----R* .........      18
..----.S... ...........--...*.........*..*. S*.G.PH------.A .....*...*     21

ED----SKRPS GIPERFSGSSSG--TMATLTISGAQVEDEADYYC YSTDSSGNH+++VV FGGGTKLTVL
*.----K...P .......*.T..--.T...S.....*..... *.R.N..DQ---RR* ..A.......     41

LNSDGSHSKGD GIPDRFSGSSSG--AERYLTISSLQSEDEADYYC QTWGTGI++++++VV FGGGTKLTVL
VTN..R.I... .........A..--.*...S..G......G.*.. ......M------H* .....*....     38
```

FIG. 11A-4

FIG. 11B



Vλ

GENE	FAM.	
7a.2.3/DPL18	VII	QTVVTQEPSLTVSPGGTVTLTC ASSTGAVTSGYYPN
2c.118D9+	II	QSALTQPPSASGSPGQSVTISC TGTSSDVGGYNYVS
DPL10/lv2066	II	QSALTQPASVSGSPGQSITISC TGTSSDVGSYNLVS
DPL7/VL1.2	I	QSVVTQPPSVSGAPGQRVTISC TGSSSNIGAGYDVH
1b.366F5/DPL5	I	QSVLTQPPSVSAAPGQKVTISC SGSSSNIGNNY-VS
1g.400B5/DPL3	I	QSVLTQPPSASGTPGQRVTISC SGSSSNIGSNY-VY
1c.10.2/DPL2	I	QSVLTQPPSASGTPGQRVTISC SGSSSNIGSNT-VN
DPL16/VL3.1	III	SSELTQDPAVSVALGQTVRITC QGDSLR---SYYAS
3p.81A4+	III	SYELTQPPSVSVSPGQTARITC SGDALP---KKYAY
4b.68B6	IV	QLVLTQSPSASASLGASVKLTC TLSSG--HSSYAIA

FIG. 11B-1

```
WFQQKPGQAPRALIY ST-----SNKHS WTPARFSGSLLG--GKAALTLSGVQPEDEAEYYC LLYYGGAQ
WYQQHPGKAPKLMIY EV-----SKRPS GVPDRFSGSKSG--NTASLTVSGLQAEDEADYYC SSYAGSNNF
WYQQHPGKAPKLMIY EG-----SKRPS GVSNRFSGSKSG--NTASLTISGLQAEDEADYYC CSYAGSSTF
WYQQLPGTAPKLLIY GN-----SNRPS GVPDRFSGSKSG--TSASLAITGLQAEDEADYYC QSYDSSLSG
WYQQLPGTAPKLLIY DN-----NKRPS GIPDRFSGSKSG--TSATLGITGLQTGDEADYYC GTWDSSLSA
WYQQLPGTAPKLLIY RN-----NQRPS GVPDRFSGSKSG--TSASLAISGLRSEDEADYYC AAWDDSLSG
WYQQLPGTAPKLLIY SN-----NQRPS GVPDRFSGSKSG--TSASLAISGLQSEDEADYYC AAWDDSLNG
WYQQKPGQAPVLVIY GK-----NNRPS GIPDRFSGSSSG--NTASLTITGAQAEDEADYYC NSRDSSGNH
WYQQKSGQAPVLVIY ED-----SKRPS GIPERFSGSSSG--TMATLTISGAQVEDEADYYC YSTDSSGNH
WHQQQPEKGPRYLMK LNS-DGSHSKGD GIPDRFSGSSSG--AERYLTISSLQSEDEADYYC QTWGTGI
```

FIG. 11B-2

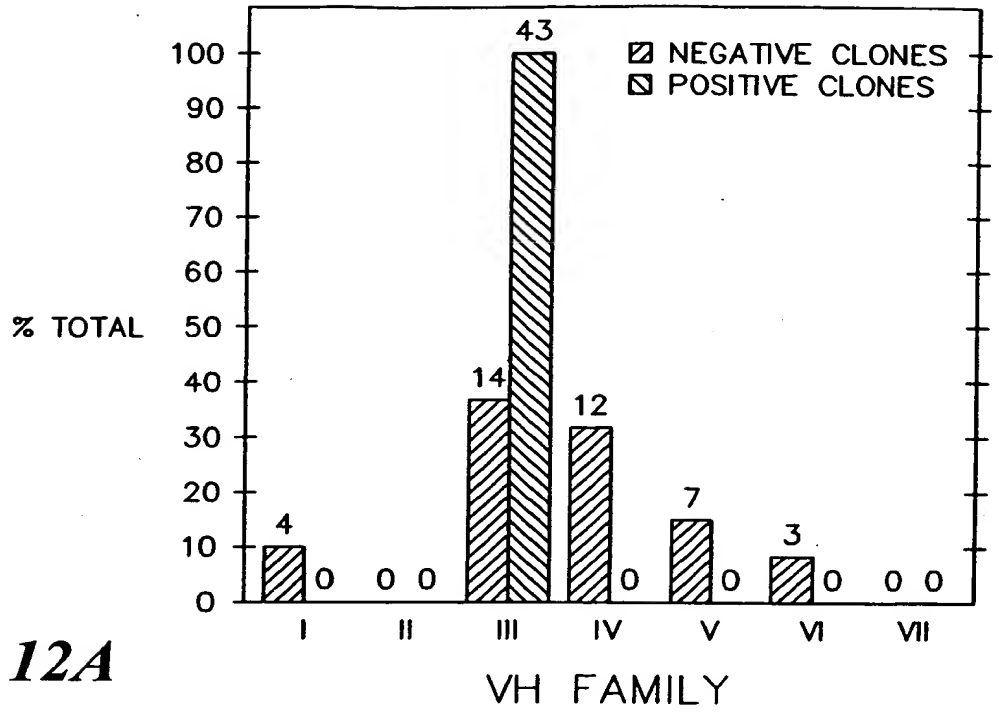


Fig. 12A

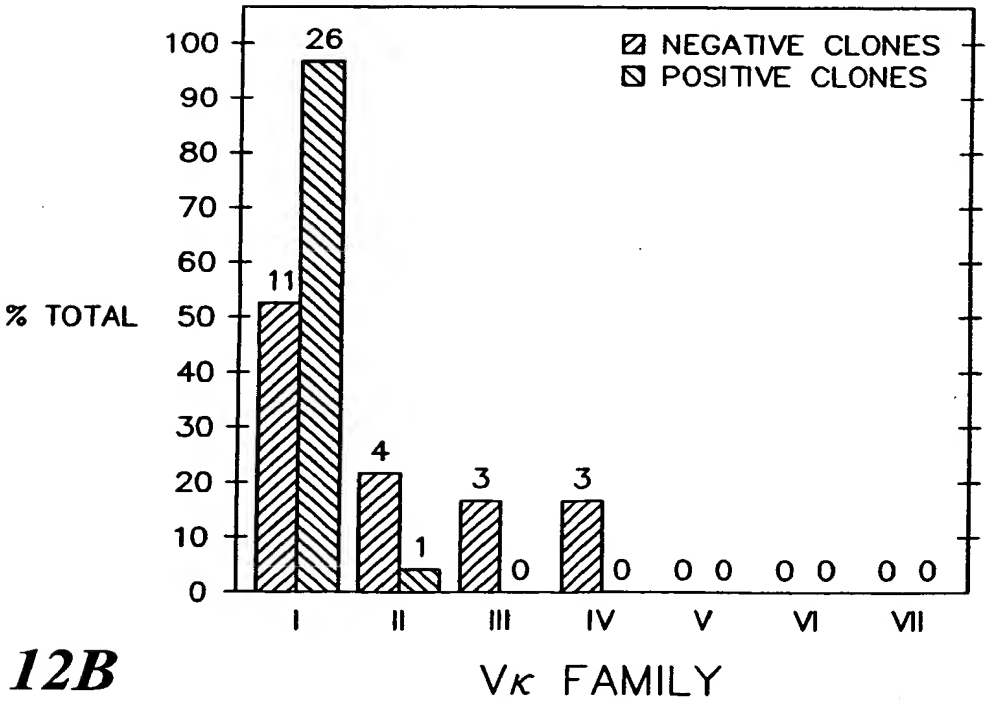


Fig. 12B

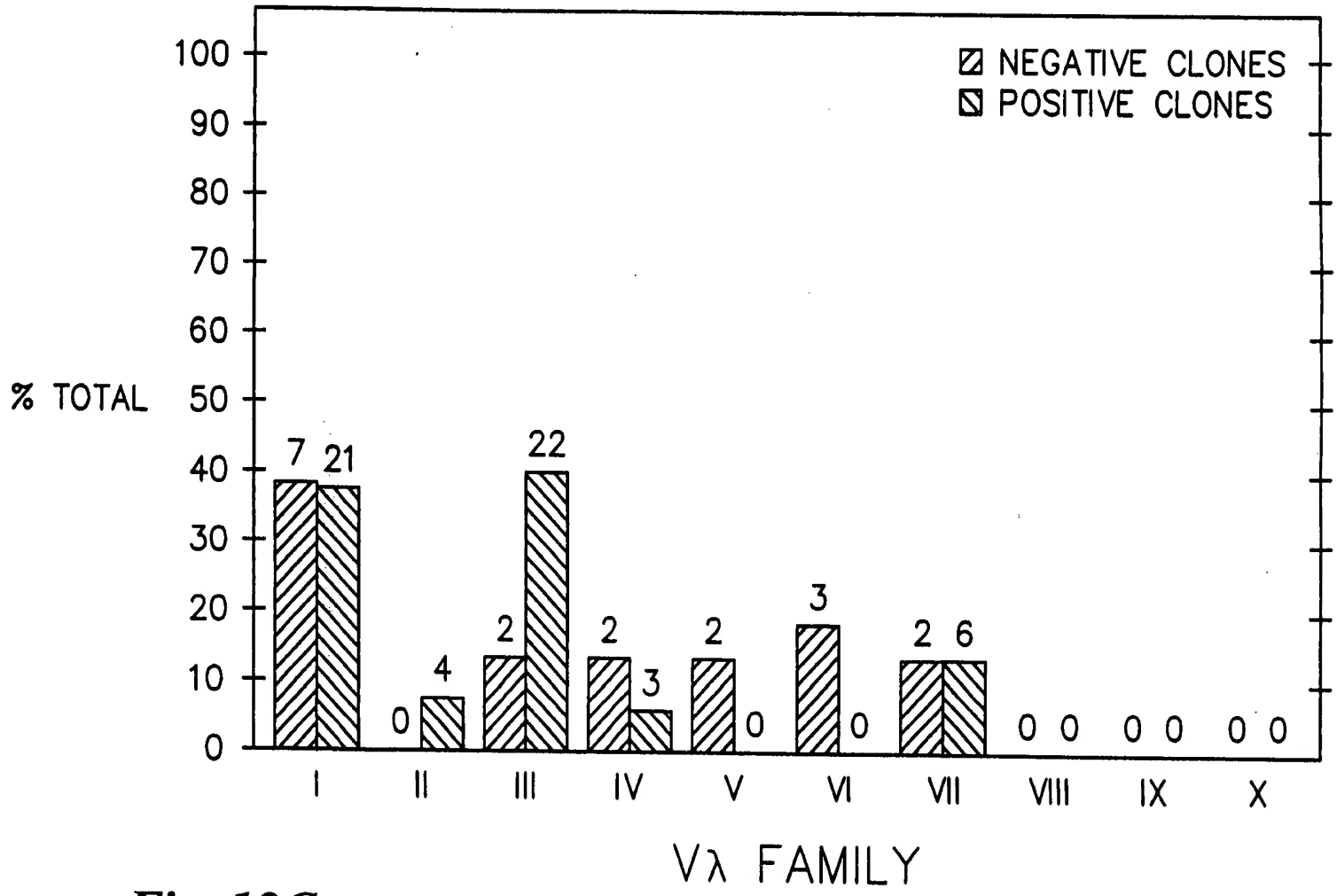


Fig. 12C

CLONE (HC/LC)	Rh(D)VARIANT CATEGORY						ASSIGNED EPITOPE
	IIIc	IVa	IVb	Va	VI	VII	
E1/L4							epD1
E1/M2							epD2
E1/M3							epD3
D20/K3							epD6/7
D7/J4							"epDX"

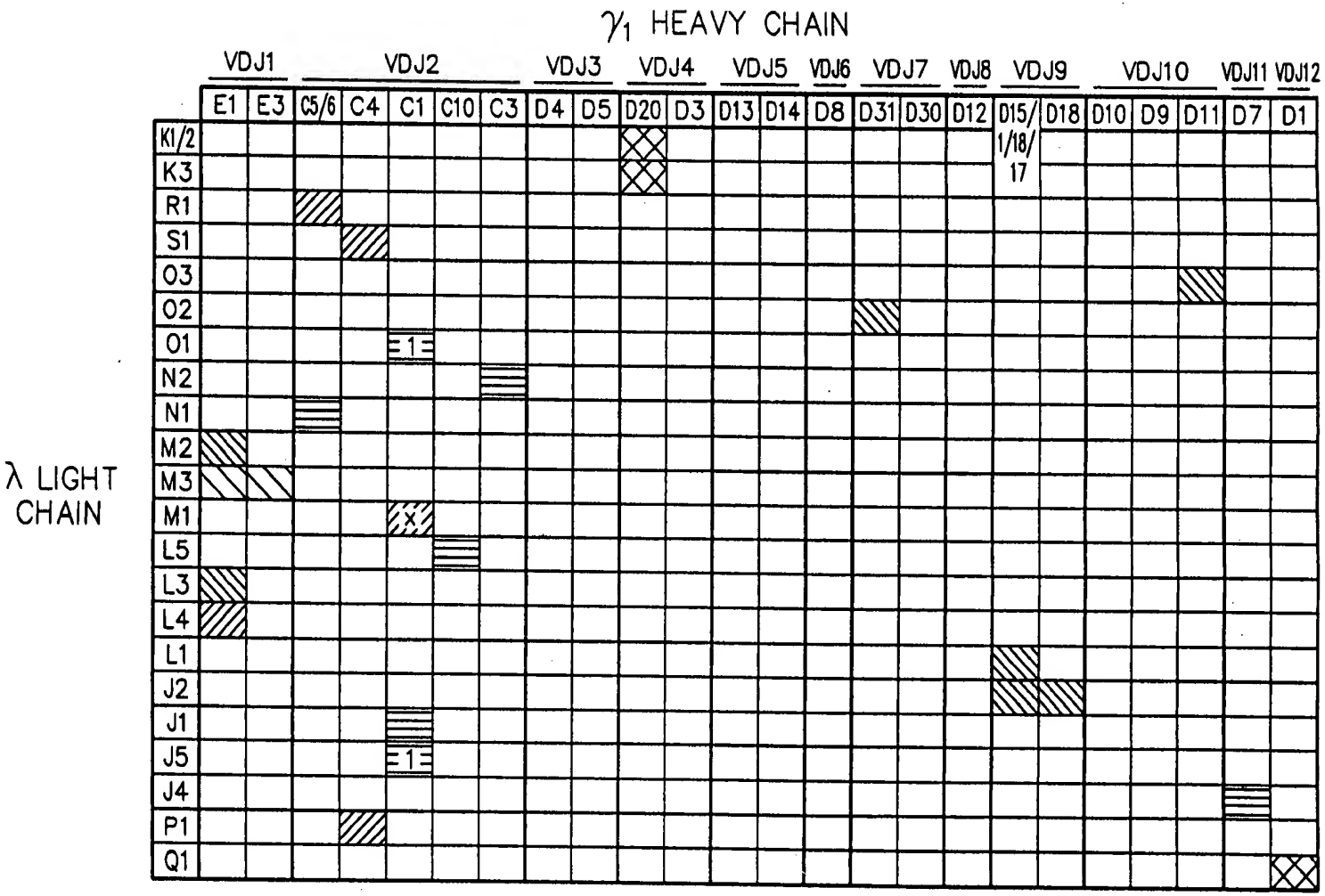


Fig. 14A

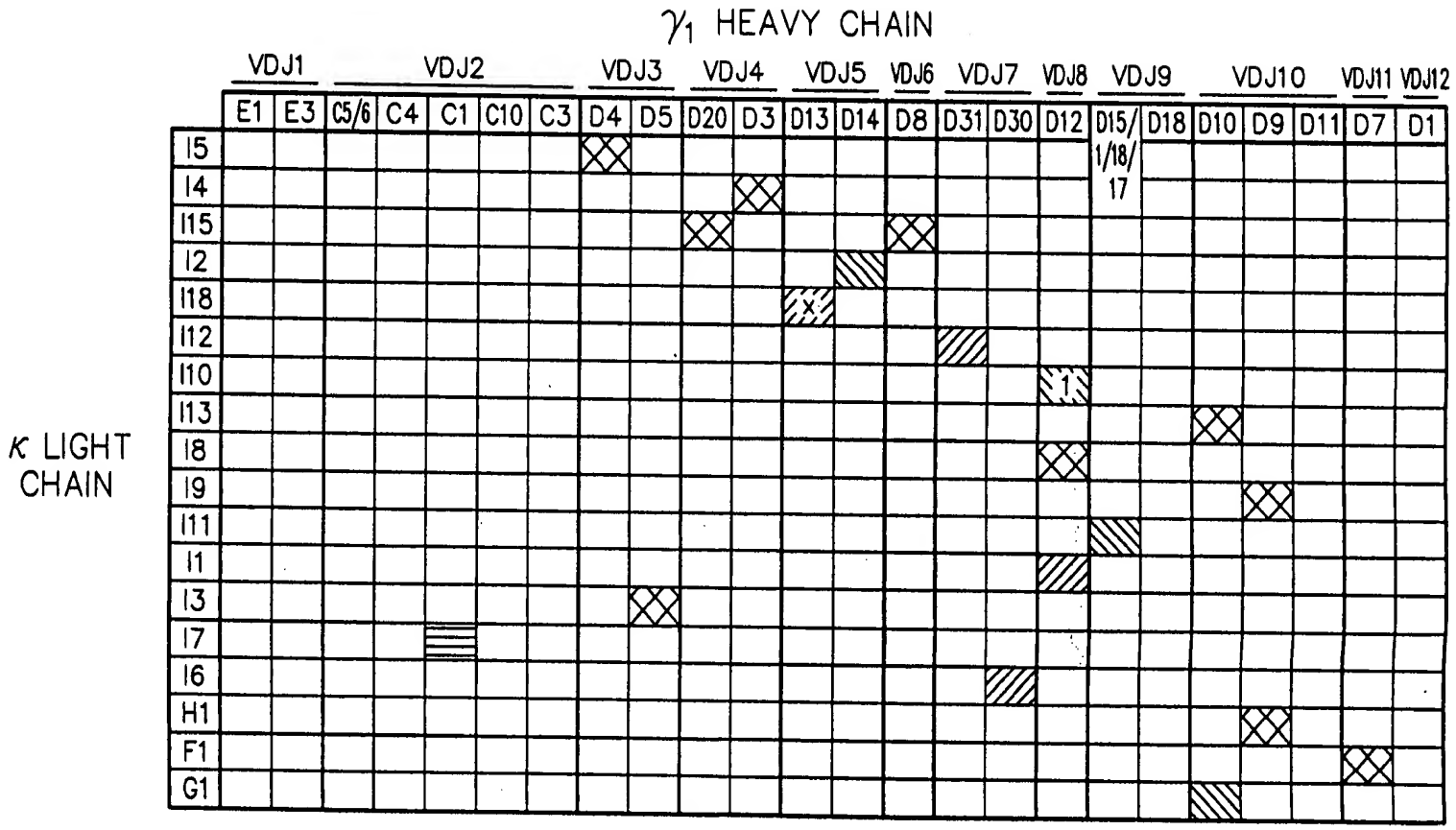


Fig. 14B

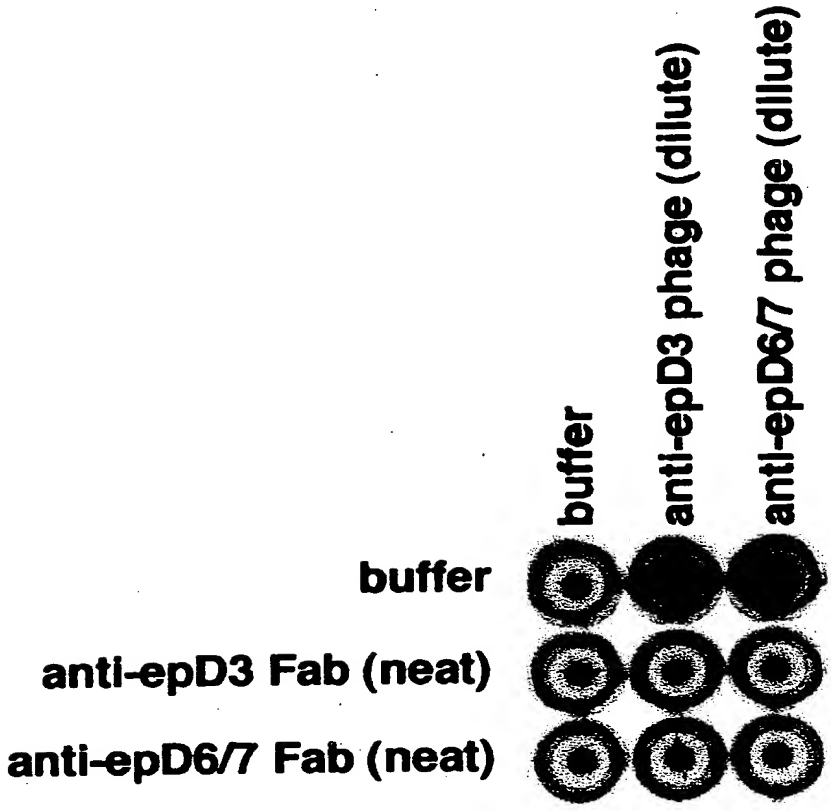


FIG. 15A

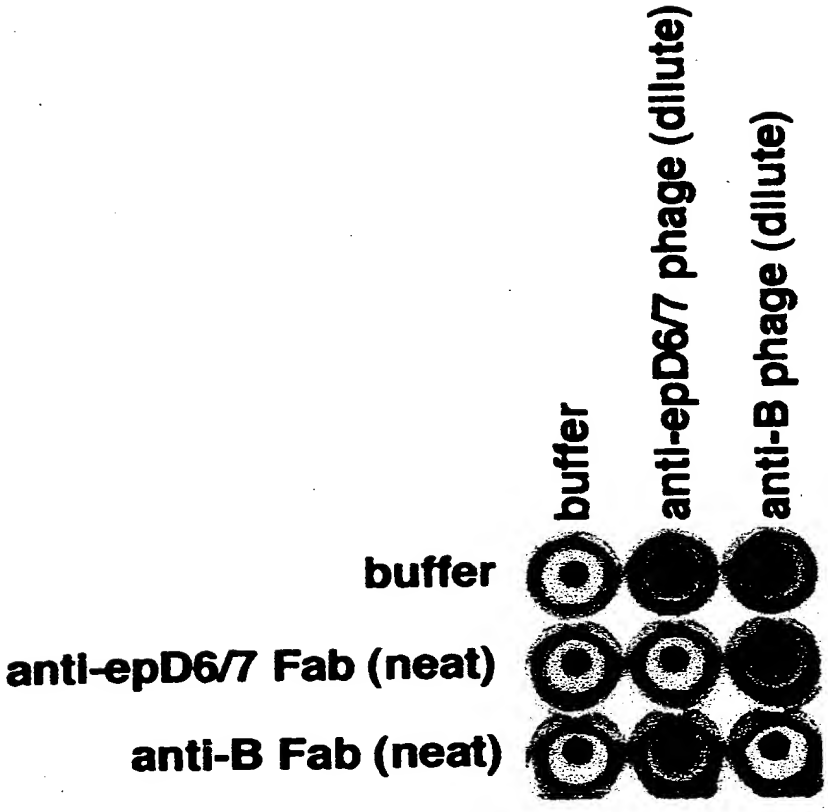


FIG. 15B

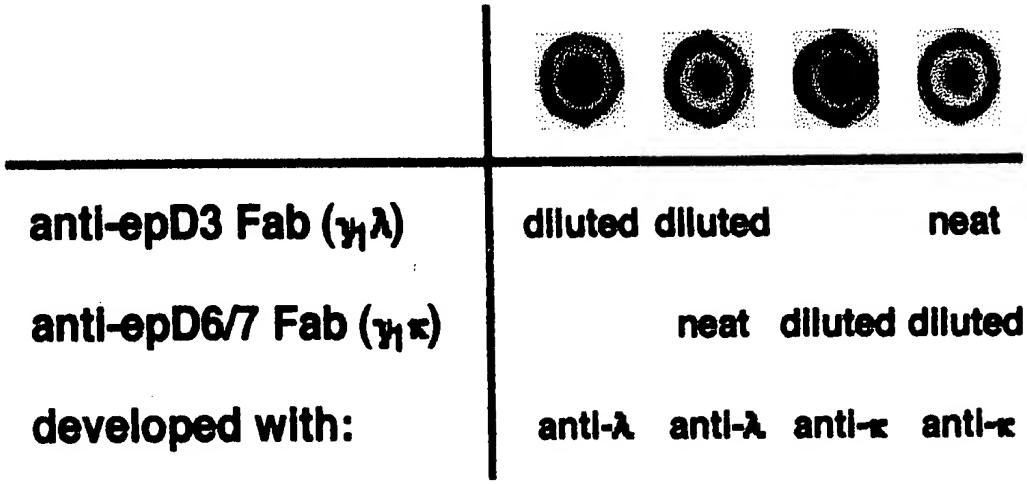


FIG. 15C

Fig. 16A

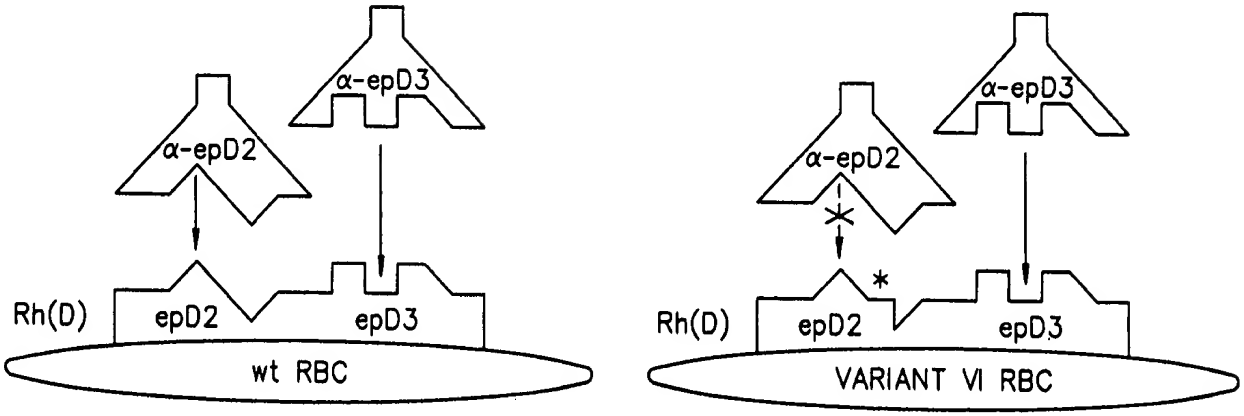


Fig. 16B

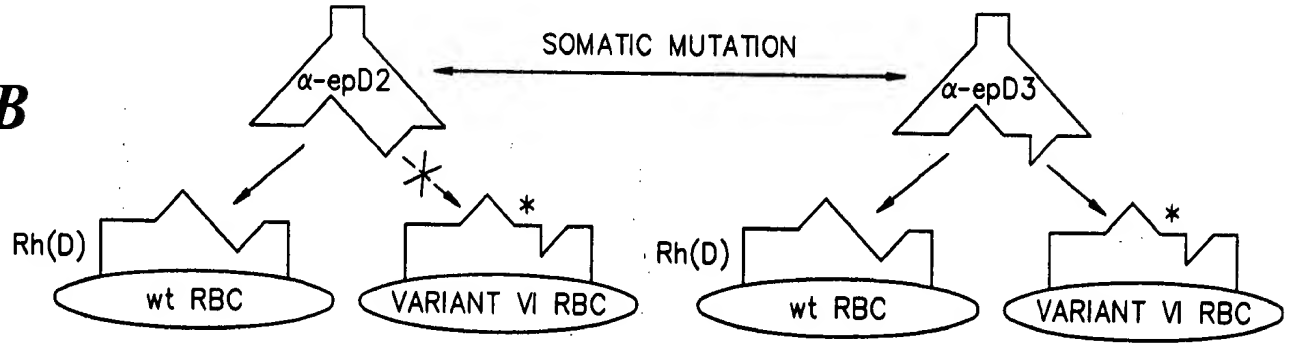


Fig. 16C